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Commentary on "Segmental analysis and literacy" (Morais et al.)

AWARENESS AND ABILITIES

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The research reported in Morais et al. (this issue) raises several extremely important theoretical, empirical and practical issues. Choosing to concentrate on the first (and to a lesser extend the second) we push a bit further some of the central concepts at the basis of the research and secondly, we look how the theory the authors introduce about the relation between segmental analysis and alphabetic literacy fares in this light.

Some key terms reappear again and again in discussions on phonological awareness (PA): conscious vs. unconscious processes, conscious vs. automatic processes, primary vs. secondary linguistic abilities, implicit vs. explicit knowledge, cognition vs. metacognition, natural vs. unnatural abilities (de Gelder, 1986). They testify to the kind of general issues raised: (1) is there a systematic relation (and one which is rélevant for the role of PA in reading acquisition) between what every speaker knows and what every reader needs to learn, and (2) does the concept of awareness give the right focus on that relation? Without prejudicing either the issue of PA or that of modularity, these questions can be dramatized: (1') does acquiring literacy build directly upon the speech processing module; (2') does awareness play a role in the way reading acquisition makes use of the speech module? Thus, an understanding of reading acquisition would force us to disentangle what goes to the credit of speech processing *per se* (and to a speech module impenetrable to literacy experience) and what is contributed by the fact the literate subject has an (alphabetic) representation of spoken language.

Turning to the history of PA

It has long been observed that speakers of a language have abilities with respect to their language that are not strictly speaking functional. For

example, pre-readers can detect rhymes, play word games and manifest some insight into grammatical categories. In the sixties various authors have explored speakers' abilities to manipulate speech sound from a descriptive point of view (Bruce, 1964; Calfee, Champman & Venezky, 1971).

In the early seventies a psycholinguistic research tradition took off influenced (at least as far as the study of reading acquisition goes) mainly by Chomsky (1972). This approach (Mattingly, 1972; Rozin & Gleitman, 1977; Gleitman & Rozin, 1977) not only adopted the linguistic theories advanced by generative grammar, for example on the phoneme, but, more importantly, welcomed enthusiastically the broad theoretical arguments in favor of the psychological reality of linguistic structures put forward in defense of generative linguistics. When this linguistic and cognitivist framework was superimposed on the earlier research, this lead to a new, theoretical notion (PA.T) erected on two major assumptions. First, the ability to process spoken language is traced down to 'tacit knowledge' (Chomsky, 1972) also called 'primary linguistic knowledge'. This move creates the impression that there is a direct link between the cognitive structures of language postulated by the saussurian-chomskyan linguist and the psychological structures of the subject's speech processor. Secondly, PA is now conceptualized as a kind of 'secondary knowledge' resulting from awareness of unconscious representations or from explicitation of tacit knowledge. Hence this tradition presents PA as the conscious counterpart or as a conscious replica of the postulated primary unconscious phonological knowledge.

Let us now list some empirical claims and predictions PA.T makes.

(a) *Awareness explains ability.* Subjects are able to perform segmental analysis because they have awareness of or access to their unconscious representations. PA.T represents the specific prerequisite metalinguistic ability for grasping the 'alphabetic principle'. Early skills at word games and rhyme detection are taken as illustrations of PA and its independence of reading acquisition. This excludes an interactional and an unilateral causal perspective but it does not exclude that training in segmentation skills and reading acquisition will enhance PA. In the PA.T tradition such enhancing effects are typically referred to as a matter of increasing awareness of the unconscious representations.

(b) Rhyme, segmentation and awareness all have the same structural basis in the speech processor. The PA.T perspective implies that the representations which we master in appreciating rhyme, which are manipulated in segmentation tasks and might well be crucial for learning to read are the ones made available by the speech processor. The metalinguistic representations only differ from the tacit linguistic representations of the speech processor by being in consciousness. But consciousness is immaterial for their structure.[1]

(c) *Metalinguistic vs. metacognitive abilities.* The emphasis on the structural basis of metalinguistic abilities together with the close relation between the notion of unconscious and that of conscious knowledge tends to pre-empt the role of *cognitive* abilities in the acquisition of reading. For example, in a piagetian tradition it is argued that the child must have the concept of phoneme or of word in order to become a reader and it is assumed that con-

cept acquisition is a cognitive achievement. In the PA.T perspective, there is no need to postulate typically central processes of concept acquisition because the linguistic concepts are represented in the speech processor and speech perception consists of speech processing plus awareness. The child learning is not in a situation where he has to construct centrally the phonemic structure of an accoustic fragment and might be helped by the fact that he has acquired the concept of a word.[2]

In the late 70's we witness a reformulation of PA.T. In contrast with the earlier emphasis on awareness, Rozin (1978) now defines access as a computational mechanism (PA.C). His idea is that the cognitive system (not the knowing subject) constructs its secondary knowledge by borrowing the speech processing program or the primary knowledge for the specific purpose of learning to decode the alphabet. The psychological, intuitive or introspective notion of access is exchanged for its computationally clear counterpart defining access as a relation between computational resources.

Does this new turn make a difference for the empirical claims made earlier by PA.T? (a) On this first point, PA.C is at odds with PA.T since it disclaims any functional importance of awareness which it disclassifies as an epiphenomenon. Moreover, the computational reformulation of PA.T inverts the whole picture of the functional relationship between PA.T and segmentation ability. On the strength of PA.C, there is no reason to expect awareness if there is no segmentation ability. (b) and (c), when we discount (a), present claims that PA.C must also endorse.

What conclusion can be drawn from this history? Clearly, PA.T and PA.C do not simply represent successive refinements of one and the same hypothesis. By inverting the picture PA.C casts doubt on the tight links between unconscious knowledge, awareness and conscious knowledge. This suggests we might sort out the three strands woven into the original PA intuition and name them in such a way that the PA.T perspective is not yet built into the terms. The three components are, first, skill at dealing with sounds, for example, rhyme production and detection (skill here replaces unconscious phonological knowledge that on behalf of PA.T is the basis of e.g. rhyming ability); secondly, awareness of linguistic properties, for example in comments on sound properties and sound similarity of spoken language (this replaces awareness in the sense of unconscious knowledge made explicit) and, finally, segmentational ability such as required for grapheme-phoneme conversions. The original PA intuition did blend the three together suggesting vaguely that they were components of one and the same ability. The PA.T enshrines this intuitive picture by claiming that all three have a common basis in the speaker's unconscious knowledge of language, more specifically in the (fully segmented but unconscious) phonological representations. It also imposes an ordering, making segmentational ability a function of skillfulness which in turn is a function of awareness. In turn, PA.C does not challenge the common basis but rearranges the order, making awareness a function of skill and skill a function of segmentational ability.

Facing the present

We now turn to segmental ability (SAB) and segmental awareness (SA) as Morais et al. discuss it. What version of PA does their SA stand for? Morais et al. do not tell how their SA relates to PA.T or PA.C nor do they start from what those theories lead us to expect about the relation between awareness, segmentation ability and rhyming ability. Nevertheless, they put great emphasis on the distinction between what they call segmental analysis ability (SAB) and segmental awareness (SA). In their view, to have SA is to have something above and beyond having SAB. What makes the distinction between awareness and ability so clear and crucial for them? One way of arguing for it would be to confront their SAB and SA with PA.T and PA.C.

To limit our discussion, let us consider only the data from illiterates. As we saw, from a PA.T perspective, an awareness of speech segments antedating or independent of reading acquisition is not surprising. It is rather its absence that would be puzzling. But PA.T has definite ideas on awareness, tracing all manifestations to awareness of the phonological knowledge. In contrast, PA.C does not predict segmentation ability in the absence of literacy. The data from illiterates disconfirm aspects of both PA.T and PA.C. Against PA.T pleads the incompleteness of segmentational abilities. But the fact that there is positive evidence for segmentational abilities even incomplete ones, pleads against PA.C. How do the authors deal with what, from the respective standpoint of PA.T and PA.C, are anomalies?

Their arguments seem to take a definite turn. They first state that the data from illiterates illustrate that segmental analysis cannot be a precondition because it does not exist independently of reading acquisition. They go on stating that segmental ability can be trained and acquired independently of literacy. But then they reduce the relevance of that finding by arguing that no real awareness or "conscious" representation of segments", no "discovery of the segmental structure of speech" is involved. Why would it need to be? True, the fact that segmentational ability can bypass awareness clashes with PA.T and is welcome to PA.C. But outside of those two perspectives the finding would merely seem to attack an intuitive trust in the role of awareness in literacy acquisition. So one does not understand why after claiming to have shown that segmental ability exists independently of literacy, the authors believe it "is an open question whether it is possible to become aware of the segmental structure of speech in the absence of confrontation with the alphabet". In dissociating awareness from ability the function and role of awareness emphasized so strongly in this paper become mysterious. But may be the point of their dissociation is to drop awareness and to lead up to the distinction between segmental ability involving phonological segments and segmentational ability not involving such (not involving linguistically categorized segments?). Dealing with rhyme would be an example of the latter. But good performance on tasks of phonological segmentation would illustrate the former. On this way of carving up the problem awareness is immaterial, what we have is a distinction between two kinds of abilities.

The issue thus reduces to the distinction between 'phonological' (we assume the authors mean 'phonetic') and 'segmental' (we assume the authors mean 'phonemic'). Illiterates do have the first but are lacking the second, thereby illustrating the interdependence between segmental awareness and literacy. The distinction seems to be meant to put off segmentational abilities related to literacy from those occurring independently. The authors appear to believe that this implies that for an understanding of reading acquisition only the segmental (in the sense of phonemic) abilities matter. And this, finally, leads them to concentrate on the question of how segmental abilities are acquired and to look for a cognitive explanation ('decentration', analysis) of segmental abilities. Their approach is somewhat inconclusive because it is difficult to come to grips with the dialectics between the general cognitive capacity and the specificity of the linguistic ability. Having stated that skills presumably have a basis in cognitive representations, their review of the data concludes by stressing the domain specificity of decentration and analysis. They try to integrate both the linguistic and the cognitive perspectives by suggesting a picture of development where general (cognitive, central) capacities are needed to actualise dormant (linguistic, modular) abilities.

At this point, we return to our conclusions from the history of PA. In the face of the noted divergences between PA.T and PA.C on the relation between linguistic skills, segmentation skills and linguistic knowledge we asked whether it would not be more fruitful to unpack the notion of PA into three components that, although each has speech sound as its input, are different with respect to kind of functional resources of the cognitive system they make use of. Of course this implies dropping the claim, at the core of PA.T and PA.C, that the same linguistic segments are central for each of the three components we distinguish, e.g. (1) skill at dealing with sound material, including speech sound, (2) knowledge of properties of linguistic objects, and (3) segmental ability as required for phoneme-grapheme conversions. Thus one might argue, firstly, that skill at rhyme might rest on the ability to deal with the prosody and the rhythm of spoken language rather than merely capitalizing on the fully segmented unconscious representations of spoken language that are presumably functional in speech processing. Secondly, awareness of properties of linguistic objects is, unlike the first and the third component, the only one that is truly a matter of the kind of understanding and insight for which it is appropriate to speak about knowledge and concepts. Thirdly, the segmentation ability required for making grapheme-phoneme conversions is a skill that must be acquired and is typically related both to the nature of the written code and the sound specifics of the language. To understand the nature of that skill one can study the specific problems raised by the kind of code that needs to be mastered. Indeed, given the alphabetic code, phonemic segmentation ability is the linguistic label for the skill that comes closest. The trouble is that the study of the nature of the skill tells us little about the way it is acquired. Morais et al. have streamlined the problem of the abilities involved in literacy up to the point where segmental skill is the crucial factor setting off alphabetic literates from the rest.

Thus they have told where the border lies. They have not yet told how it got there. A skill is defined by telling what is involved in exercising it. But telling what is involved in a skill is not the same as telling how it is acquired. We wonder whether in trying to locate the specific ability involved in alphabetic literacy the authors have not given away the other components that, while being irrelevant for defining the nature of the specific skill, are nevertheless crucial for explaining its acquisition. We cannot assume, like Morais et al. do, that non-segmental abilities do not contribute to reading acquisition. We cannot, unlike them, be certain at this stage that knowledge of linguistic objects (what they call awareness) is not needed for acquisition of segmental skill. And we cannot exclude that artificial systems that can neither recognize rhyme the way we do nor know about or reflect upon language, can still master segmen-tal skills needed for grapheme-phoneme conversions.

Notes

1. This notion of metalinguistic abilities rests upon the idea that metalinguistic knowledge is tacit linguistic knowledge made explicit. The appeal of this idea is largely due to the ambiguity of the notion of knowledge as used by linguists and psychologists. Psychological theories are concerned with knowledge attributions (e.g. propositions about what an organism knows) in a different way than linguist theories are. Even on the most cooperative picture of the two disciplines, psychological theories are in the business of making proposals about the way the linguist's knowledge attributions are actually implemented in the processes explaining the behavior that is the target of the linguist's knowledge attributions. This means that the linguist's knowledge attributions do not directly licence propositions about what an organism knows in an ordinary, a doxastic or an epistemic sense of the word knowledge. In the psychological literature the use of the term metalinguistic remains clouded in mystery. The clouds have become thicker since distinctions like procedurial vs. declarative have been superimposed upon implicit vs. explicit and linguistic or cognitive vs. metalinguistic or metacognitive. It would help to oppose linguistic knowledge to knowledge of language. The first is a theoretical means of describing the functional architecture of the system (e.g. how the speech processor operates) while the second is knowledge properly speaking (e.g. what the child or the adult knows about the properties of linguistic objects). Once this is clear, there is no reason to expect any intrinsic link between linguistic knowledge and knowledge of language. Also, there is no need to insist on the notion of metalinguistic knowledge. As we note further on, the concept of awareness does not carve up the problem at its joints. For the notion of knowledge in the sense of functional architecture, awareness is not an issue, while knowledge in the ordinary sense can be either implicit, tacit or explicit, etc. But, again, tacit knowledge must not be confused with functional architecture.
2. We should note that there is a corrolary to the thesis that awareness has a linguistic as opposed to a cognitive basis. If awareness and not cognitive ability explains metalinguistic abilities, then we cannot invoke cognitive explanations for differences in degree of accessibility of the unconscious linguistic representations. For example, if the basic segments at the sound processing level of the speech processor are phonemes, then there is no intrinsic and principled reason why phonemes should be more difficult to manipulate than syllables.

References

Bruce, D.J. (1964). The analysis of word sounds by young children. *British Journal of Educational Psychology, 34*, 158-170.

Calfee, R.C., Chapman, R., & Venezky, R. (1971). How a child needs to think to learn to read. In L.W. Gregg (Ed.), *Cognition in learning and memory*. New York: Wiley.

Chomsky, N. (1972). *Language and mind* (enlarged edition). New York: Harcourt, Brace & Jovanovich.

De Gelder, B. (1986). Phonological awareness reconsidered. Manuscript.

Gleitman, L.R., & Rozin, P. (1977). The structure and acquisition of reading. i: Relations between orthographies and the structure of language. In A.S. Reber & D.L. Scarborough (Eds.), *Toward a psychology of reading*. Hillsdale, NJ: Lawrence Erlbaum.

Mattingly, I.G. (1972). Reading, the linguistic process, and linguistic awareness. In J. Kavanagh & I.G. Mattingly (Eds.), *Language by ear and by eye*. Cambridge: MIT Press.

Morais, J., Alegria, J., & Content, A. (1987). The relationship between segmental analysis and alphabetic literacy. *Cahiers de Psychologie Cognitive, 7* (5), 415-438.

Rozin, P. (1976). The evolution of intelligence and access to the cognitive unconscious. In J.M. Sprague & A.N. Epstein (Eds.), *Progress in psychobiology and physiological psychology, VI.* New York: Academic Press.

Rozin, P., & Gleitman, L.R. (1977). The structure and acquisition of reading. II: The reading process and the acquisition of the alphabetic principle. In A.S. Reber & D.L. Scarborough (Eds.), *Toward a psychology of reading*. Hillsdale, NJ: Lawrence Erlbaum.